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10/790,223	03/02/2004	Motonori Nakamura	50395-255	9845

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EXAMINER	
HERRING, LISA L	

ART UNIT	PAPER NUMBER
1731	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/790,223	Applicant(s) NAKAMURA ET AL.	
	Examiner Lisa Herring	Art Unit 1731	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☒ Claim(s) *11-13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7 June 04*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 5, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakayama et al. (JP05-306136) and Walas ("Chemical Process Equipment Selection and Design", 1990.

3. Regarding claims 1 and 7, Nakayama discloses a method of producing a glass particle deposited body, the method using a reaction container (Fig. 1) provided with:

a) at least one burner (4) for synthesizing glass particles (paragraph [0002])

b & c) a gas discharging pipe (5) connected to a gas discharging port;

d) synthesizing glass particles by using the at least one burner in the container; and (paragraph [0002])

e) moving at least one member, specifically the starting material by vertically raising it, so that the glass particles can adhere to the surface of the starting material to be deposited (paragraph [0003]

Nakayama discloses velocity sensors (6) placed in upper and lower positions throughout the reaction chamber (Fig. 1 and paragraph [0011]) and the flow of the air in the deposition chamber affects physical and optical fluctuations in the preform

(paragraph [0005]). Nakayama discloses the air control can be scrupulously controlled at each position. Nakayama fails to disclose the condition that:

f) the reaction container's internal pressure P_H is adjusted to be higher than the pressure P_L by 2 to 30 Pa. However, since it is well known in the art that pressure is controlled by regulating the flow of effluent from the vessel, as evidenced by Walas, the pressure is inherently being adjusted in the upper and lower positions of the chamber by adjusting the velocity of air throughout the chamber using the velocity sensors. As stated earlier, Nakayama fails to specifically disclose the internal pressure P_H is adjusted to be higher than the pressure P_L by 2 to 30 Pa, but Nakayama discloses the flow rate can be scrupulously controlled at each position and that the flow of air in the deposition chamber, which inherently affects the pressure, affects physical and optical fluctuations in the preform. Accordingly, it would have been obvious to one skilled in the art at the time the invention was made to adjust the pressure at various positions, since it is inherently adjusted by the flow rate, in the process of Nakayama, and since it has been held that discovering an optimum value of a result effective variable, such as the pressure or flow rate affects the physical and optical fluctuations in the preform, as taught by Nakayama, involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (MPEP 2144.05 II).

Regarding claim 5, the gas discharge port covers a large portion of the reaction chamber. The position of the port overlaps the location of the burners (4) (Drawing 1). Therefore, the at least one gas-discharging port is placed at the same height as that of the at least one burner for synthesizing glass particles.

Regarding claim 8, Nakayama discloses the reaction container is provided with clean gas-feeding ports (3). Nakayama fails to specifically disclose the method further being specified by the condition that the gas-feeding port is the same as or higher than the pressure in the reaction container at the same height as that of the at least one clean-gas feeding port. However, it is inherent that the pressure of the clean gas-feeding port is the same as or higher than the reaction container at the same height of the at least one clean gas-feeding port, since air flow has been disclosed. If the chamber had a higher pressure than the gas feeding port, it could not enter the chamber.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakayama et al. (JP05-306136) and Walas ("Chemical Process Equipment Selection and Design", 1990 as applied to claim 1 above, and further in view of Nishio (2001-089179). Nakayama fails to disclose a) the at least one-gas discharging port is at least two gas-discharging ports; and b) the pressure in the gas-discharging pipe is adjusted such that the pressure increases with increasing height of the position of the gas-discharging port to which the gas-discharging pipe is connected. However, Nishio discloses a deposition process with multiple core burners (5 and 6) and a clad burner that contains at least two discharge ports, each with pressure control (Drawing 1 and paragraph [0021]). Nishio discloses the second exhaust pipe improves the exhausting of fluorine during the deposition to reduce the refractive index distribution over the length of the preform (paragraph [0007]-[0015]). Therefore, it can be deduced that the second exhaust port would improve the exhausting of all gas in the chamber.

Accordingly, it would have been obvious to one skilled in the art at the time the invention was made to have at least two gas-discharging ports in the apparatus of Nakayama, since it has been taught by Nishio to improve the exhausting of gases during the deposition process. As discussed previously, Nakayama discloses varying the velocity of the air flows in the deposition chamber by position and discloses the physical and optical fluctuations of the preform are affected by these flows and Nishio discloses a second exhausting port, wherein the pressures in the exhaust port improve the exhausting of gases during the deposition process. Both references fail to specifically disclose the pressure in the gas-discharging pipe is adjusted such that the pressure increases with increasing height of the position of the gas-discharging port to which the gas-discharging pipe is connected. However, it has been taught by Nakayama the velocity of the flow in the chamber affects the physical and optical fluctuations of the preform and that flows inherently affect pressure, as evidenced by Walas, and Nishio discloses the second exhaust port improves exhausting of gases and the pressure is controlled by a valve, which controls flow in the pipe. Therefore, it can be deduced that the pressure and the flow are result effective variables in a deposition process that affect the opticals, as taught by Nakayama and Nishio. Accordingly, it would have been obvious to one skilled in the art at the time the invention was made to optimize the pressure along the longitudinal direction of the preform in the chamber, since it has been held that discovering an optimum value of a result effective variable, such as pressure and flow on the physical and optical fluctuations in the preform involves only

routine skill in the art. In re Boesch, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980) (MPEP 2144.05 II).

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakayama et al. (JP05-306136) and Walas ("Chemical Process Equipment Selection and Design", 1990 as applied to claim 1 above, and further in view of Abbott et al. (5,116,400) and Snow et al. (Plant Engineer's Reference Books, 2002). Nakayama and Walas fail to disclose the reaction chamber is further provided with a heat source in it to achieve the pressure P_H higher than the pressure P_L by using the heat supplied from the heat source. However, Abbott discloses an end heater in the top and bottom region of the preform to minimize the effects of thermal gradients along the length of the preform and that in a vertical orientation non-uniformities in the preform are due to convective air flows along the length of the preform. It is well known in the art, as evidenced by Snow, that convection results from a change in density in parts of the fluid, the density change being brought about by an alteration in temperature, hence causing a change in the flow of the fluid, such as a gas. Therefore, it can be deduced from Abbott and Snow that convective air flows can be created by the use of a heat source, and can be applied to the teachings of Nakayama that disclose the air flows affect the optical and physical properties of the preform during the deposition process. Accordingly, it would have been obvious to one skilled in the art at the time the invention was made to provide a heat source in the apparatus of Nakayama for the advantage of minimizing the effects of thermal gradients along the preform. Additionally, it would have been obvious to one skilled in the art at the time the invention was made to use a heat source to optimize a

pressure differential in the process of Nakayama, since it has been taught by Abbott and Snow that a heat source affects air flows, and since it has been held that discovering a result effective variable, such as pressure and flow on the optical and physical properties of the preform, involves only routine skill in the art. In re Boesch, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980) (MPEP 2144.05 II).

6. Claims 4, 6, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakayama et al. (JP05-306136) and Walas ("Chemical Process Equipment Selection and Design", 1990) in view of Nishio (2001-089179).

7. Regarding claim 4, Nakayama discloses a method of producing a glass particle deposited body, the method using a reaction container (Fig. 1) provided with:

a) at least one burner (4) for synthesizing glass particles (paragraph [0002])

b & c) a gas discharging pipe (5) connected to a gas discharging port;

d) synthesizing glass particles by using the at least one burner in the container; and (paragraph [0002])

e) causing the glass particles to adhere to the surface of a starting material (paragraph [0003])

Nakayama discloses velocity sensors (6) placed in upper and lower positions throughout the reaction chamber (Fig. 1 and paragraph [0011]) and the flow of the air in the deposition chamber affects physical and optical fluctuations in the preform (paragraph [0005]). Nakayama discloses the air control can be scrupulously controlled at each position. Additionally, it is well known in the art that pressure is controlled by regulating the flow of effluent from the vessel, as evidenced by Walas. Therefore, it can

be deduced the pressure is inherently being adjusted in the upper and lower positions of the chamber by adjusting the velocity of air throughout the chamber using the velocity sensors. Further, Nakayama discloses the flow rate can be scrupulously controlled at each position and that the flow of air in the deposition chamber, which inherently affects the pressure, affects physical and optical fluctuations in the preform.

Nakayama fails to disclose the condition that:

8. Nakayama fails to disclose a) the at least one-gas discharging port is at least two gas-discharging ports; and b) the pressure in the gas-discharging pipe is adjusted such that the pressure increases with increasing height of the position of the gas-discharging port to which the gas-discharging pipe is connected. However, Nishio discloses a deposition process with multiple core burners (5 and 6) and a clad burner that contains at least two discharge ports, each with pressure control (Drawing 1 and paragraph [0021]). Nishio discloses the second exhaust pipe improves the exhausting of fluorine during the deposition to reduce the refractive index distribution over the length of the preform (paragraph [0007]-[0015]). Therefore, it can be deduced that the second exhaust port would improve the exhausting of all gas in the chamber. Accordingly, it would have been obvious to one skilled in the art at the time the invention was made to have at least two gas-discharging ports in the apparatus of Nakayama, since it has been taught by Nishio to improve the exhausting of gases during the deposition process. As discussed previously, Nakayama discloses varying the velocity of the air flows in the deposition chamber by position and discloses the physical and optical fluctuations of the preform are affected by these flows and Nishio discloses a second

exhausting port, wherein the pressures in the exhaust port improve the exhausting of gases during the deposition process. Both references fail to specifically disclose the pressure in the gas-discharging pipe is adjusted such that the pressure increases with increasing height of the position of the gas-discharging port to which the gas-discharging pipe is connected. However, it has been taught by Nakayama the velocity of the flow in the chamber affects the physical and optical properties of the preform and that flows inherently affect pressure, as evidenced by Walas, and Nishio discloses the second exhaust port improves exhausting of gases and the pressure is controlled by a valve, which controls flow in the pipe. Therefore, it can be deduced that the pressure and the flow are result effective variables in a deposition process that affect the opticals, as taught by Nakayama and Nishio. Accordingly, it would have been obvious to one skilled in the art at the time the invention was made to optimize the pressure along the longitudinal direction of the preform in the chamber, since it has been held that discovering an optimum value of a result effective variable, such as pressure and flow on the physical and optical fluctuations in the preform involves only routine skill in the art. In re Boesch, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980) (MPEP 2144.05 II).

9. Regarding claim 6, the gas discharge port covers a large portion of the reaction chamber. The position of the port overlaps the location of the burners (4) (Drawing 1). Therefore, the at least one gas-discharging port is placed at the same height as that of the at least one burner for synthesizing glass particles. Additionally, Nishio also discloses the top portion of burner 7 overlaps a portion of the gas-discharging port.

Therefore, the at least one gas-discharging port, in the reference of Nishio, is placed at the same height as that of the at least one burner for synthesizing glass particles.

Regarding claims 9 and 10, Nakayama discloses the reaction container is provided with clean gas-feeding ports (3). Nakayama fails to specifically disclose the method further being specified by the condition that the gas-feeding port is the same as or higher than the pressure in the reaction container at the same height as that of the at least one clean-gas feeding port. However, it is inherent that the pressure of the clean gas-feeding port is the same as or higher than the reaction container at the same height of the at least one clean gas-feeding port, since air flow has been disclosed. If the chamber had a higher pressure than the gas feeding port, it could not enter the chamber.

Allowable Subject Matter

10. Claims 11-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to suggest or disclose the following combination of a)-d)

a) the reaction container's internal pressure is measured at a position some distance apart in a direction horizontally from the center of each of the gas-discharging ports;

b) the internal pressure of each of the gas-discharging pipes connected to the gas-discharging ports is measured at a position some distance apart horizontally from the center of the gas-discharging port to which it is connected;

c) the difference between the two pressures expressed in (a) and (b) above with respect to each of the gas discharging ports is obtained (the difference is referred to as the difference between the inside and outside pressures of the gas-discharging port); and

d) the difference between the inside and outside pressures of each of the gas-discharging ports is adjusted to fall within a range of 70% to 130% of the average value of the differences between the inside and outside pressures of all of the gas-discharging ports.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Matsuo et al. (JP07300332) discloses an apparatus with 3 discharge ports and adjusting the flow rate in the exhaust pipes.Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lisa Herring whose telephone number is 571-272-1094. The examiner can normally be reached on Mon-Fri. 7:30 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

L. Herring

SEAN VINCENT
PRIMARY EXAMINER